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ABSTRACT

This paper describes a follow-up study conducted in 1991 to examine how the informal education and representational strategies of the Zinacantecos have been affected by modernization since the original study of their culture was conducted in 1969-70. The follow-up study tracked two generations of mothers and children as the Zinacantecos society moved from a subsistence to an entrepreneurial, cash economy. The paper compares photographic slides of typical daily activities as they were conducted in 1969-70 and in 1991. It focuses on the weaving techniques and pattern designs of the Zinacantecos women, and how these techniques and designs were transmitted from one generation to the next. An analysis of slides and motion pictures taken in 1969-70 and in 1991 showed that while in the earlier period most of the weaving instruction was very structured and systematic, instruction in the latter period was more discovery-oriented, with independent trial-and-error replacing mother-dominated repetitive learning. The study also found that in the earlier period only set patterns and designs were used, whereas constant pattern innovation and new motifs are predominant today. These results suggest that the Zinacantecos' weaving process is following the general evolution of Zinacantecos society toward modernization, innovation, and entrepreneurial attitudes. (MDM)

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HISTORICAL CHANGE AND COGNITIVE CHANGE: A TWO-DECADE FOLLOW-UP STUDY IN ZINACANTAN, A MAYAN COMMUNITY OF SOUTHERN MEXICO

In 1985, Sylvia Scribner published a pathbreaking paper on Vygotsky's uses of history. Since that time there has been increasing interest in the sociohistorical approach to development. Yet the developmental implications of historical change have not been studied directly, by comparing the development and socialization of one generation with that of the next. Our twenty-year follow-up investigation of informal education and representational strategies among the Zinacantecos, a Mayan people of Southern Mexico begins to fill this gap by studying two generations of mothers and children

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as their society moves from subsistence to an entrepreneurial cash economy.

Sylvia was very excited about my going back to Zinacantan after two decades; she died just as I began my field research in July 1991. I regret that I never had a chance to tell her what happened when I went back. In my mind, this project is very much dedicated to Sylvia's memory; today is one of the infinite number of occasions on which her presence is very much missed.

In so far as the process of socialization prepares the next generation to participate in society, it should change when the conditions faced by that next generation differ from the environment in which their parents grew up. Socialization is intrinsically future oriented - it prepares children for an adulthood that has not yet arrived. It follows that changing socialization patterns should be a key component of the psychological adaptation to social change.

An important question is, in conditions of change, do parents merely recreate the socializing process that they underwent as children? Or is there a capacity to develop new methods and processes as societal conditions, in this case, economic conditions, change? And what, if any, are the consequences of such changes in socialization for the development of children?

There is a connection between socialization and cultural artifacts. In nonindustrial societies, children are socialized to produce cultural

artifacts through a process of informal education or apprenticeship. What is the relationship between the pedagogical methods of informal education and the nature of the cultural artifacts that are produced? Do new cultural artifacts lead to new methods of apprenticeship? And vice versa.

If we are to answer these questions in the most rigorous way, longitudinal evidence across more than one generation is required. The evidence must be both behavioral and historical. It is precisely this sort of controlled longitudinal, historical, behavioral data that has, up to now, been lacking. And it is precisely this kind of evidence that I will present here today.

SLIDES

In 1969 and 1970, I carried out a number of studies of culture, learning and cognitive development in Nabenchauk, a hamlet of the agrarian Mayan community of Zinacantan. My co-worker was Carla Childs.

(The numbers that follow refer to slides that will be shown.)

1. Nabenchauk: Scene of the research twenty years ago.

These were the people who had best carried a traditional, albeit syncretic ancient Mayan way of life into the modern world.

Agrarian. Corn & beans. Tzotzil.

2. Katal, 1970, at loom - Weaving was our focus for studying processes of informal education, teaching and learning in a society in

which education does not traditionally take place in school. Ancient Mayan backstrap loom.

At that time, it was concluded that the goal of Zinacanteco education and socialization was the intergenerational replication of tradition. The way in which weaving was taught fostered this goal: The process was a highly scaffolded, relatively error-free one, in which the teacher, usually the mother, sensitively provided help, models, and verbal direction in accord with the developmental level of the learner (Childs & Greenfield, 1980; Greenfield, 1984).

The maintenance of tradition excluded the value of innovation, and this was manifest in the stable repertoire of woven patterns, limited to two red-and-white striped configurations (3, 4, 5), one multi-color stripe (6), and one basketweave pattern.

7. Volkswagen van: symbol of economic change. Farmers went into the transport business. Entrepreneurial commerce.
Because commercial entrepreneurship entails an ideology of innovation, certain predictions were made about changes in informal weaving education and changes in textiles, the artifacts of weaving. First, a theory had been developed (Greenfield, 1984; Greenfield & Lave, 1982) that there is a contrast between the goals of two methods of informal education: scaffolding (or guided participation, as it is sometimes called) with observational models (1970), on the one hand, vs. relatively independent trial-and-error learning on the other. Whereas the first is adapted to the transmission of tradition

(and was what we found in 1970), the second, with its emphasis on the learner's own discovery process, is adapted to the development of skill in innovation (expected in 1991). If innovation had entered the culture as a value orientation in response to entrepreneurship, it was thought that weaving education would make a corresponding shift away from scaffolding (or developmentally sensitive guidance) to a more discovery oriented and independent trial-and-error process.

A second prediction was that weaving artifacts would no longer be limited to a small stock of patterns; instead weavers would constantly innovate new patterns. This was conceived of as a major developmental process. Both these hypotheses were formulated on the basis of theory alone. I had not been back to Zinacantan in 21 years. With Carla Childs, went back in 1991 to test these predictions. Nabenchauck had changed. Slides before and after (8, 9). (End of slides)

Hypothesis 1: instructional strategies

We thought that the old method of observation of models, in conjunction with receiving developmentally sensitive help would change. Earlier the teacher had carefully built a scaffold of help for the learner, providing help before the learner had an opportunity to make a serious error. Because the learner, in this situation, received very little opportunity to make a mistake, let alone to explore, we predicted that the methods of teaching and learning would have changed to a more independent trial-and-error approach.

In order to test this hypothesis, we went back to study the daughters of our 1970 weaving subjects. We had 14 in our original sample.

10. Katal , 1970, at loom. Here is one (Katal) you saw before.

11. She grew up (slide: Katal as a woman, 1991) and had daughters of her own.

We succeeded in locating 14 daughters (of seven mothers) who were old enough to weave for us, some for the very first time. In addition, we expanded our sample of weaving learners to 50, so that we would be able to statistically examine the effects of various factors, such as attending school or selling weaving, on the methods of informal education. For my presentation here, I am going to use some well controlled historical examples to illustrate our findings.

The 1970 data were collected on black and white reel to reel video, so the quality is "historical." First you will see a girl, age 9 (the one in the slide), learning to weave. I have used stills to try to dramatize certain points. In the first still, Katal is there by herself. What I want you to notice is that her mother enters to help on her own initiative, without being summoned by her daughter. This is in sharp contrast to what you will later see when Katal's daughter, also age 9 learns to weave in 1991.

Start first tape (Katal, 1970, learning to weave). Second scene: Her mother is very much there, continuously helping or doing part of it for her daughter.

Show new tape (Losha, Katal's daughter, learning to weave in 1991; older sister Shunka serves as teacher). Katal's daughter Losha, same age as her mother had been in 1970. (1) Note that her mother is not there at all. As you will see in a minute, it is not because she is not at home. She definitely chooses not to be part of the weaving session. Second, note that her sister is the teacher, but she is paying little attention and Losha has to call her twice to get her attention. Much more independent learning. See mother (second scene); she is embroidering a blouse which I have ordered to buy in another part of the courtyard. This generational contrast in teaching styles is all the more amazing, given, as Carla Childs pointed out to me, we generally learn how to teach from the way our mothers taught us. In addition, of all of Katal's sisters, she is temperamentally most like her mother (Losha's grandmother), so, on the basis of both her mother's genes and her mother as model, one would have expected the same style. This is a powerful example of adapting teaching to changed conditions in the space of a single generation.

Now I want to go back to a different 1970 weaving subject for another controlled comparison. For this comparison, I selected the one family in which there were two weaving subjects in 1970 the same age as Losha and her sister Shunka (approximately age 9 and 13). Remember, in the 1991 tape, we saw the learner Loxa, her sister, Shunka, the "teacher", and her mother sitting in another part of the courtyard. Contrast the roles and positions of mother and

older sister in 1991 with what I am going to show you from 1970 in the opening still:

Show tape. (1970: weaving learner, age 9; older sister, age 13; mother). Still shot - sister, mother, and learner: all involved. Next scene: mother makes measuring stick - advises "teacher," who is older sister. The "teacher" is totally hands on, helping the learner. Hierarchy of control from elder to younger. Mother tells older sister, who shows younger sister. This was quintessential Zinacanteco values concerning human relations in 1970. This hierarchy gone in many areas of life. Quite dramatic in weaving where older women do not even know all of the techniques mastered by their daughters.

Tape showed more independent learning in 1991 than in 1970, whether we compare Losha with the way her mother learned or we compare her with another 1970 weaver matched for the family configuration of people on the scene.

These examples support hypothesis 1: The learning of weaving has become more independent, with less guidance and modeling.

According to my model, independent trial-and-error learning would be associated with pattern innovation. The idea being that if you are experimenting independently, you might create or discover something new. Let's now look at what had happened to the weaving artifacts in 1991.

This brings me to Hypothesis 2: that patterns would no longer be limited to 3 stripes and a basketweave, that there would be an ongoing process of pattern innovation and creation. These results were quite astonishing.

12. old pok kuul (poncho)

13-15. Several variants. Not just variety, but representation introduced. (#15 shows border being woven.)

Furthermore, entrepreneurship and commerce was not just limited to trucking; it had hit weaving as well.

16. Commercialization. Selling on road - With new commercial item - made for tourists - in background (servilleta)

17-19. New commercial items.

In conclusion, Hypothesis 2 was confirmed also: Now constant pattern innovation, with new motifs and recombination of existing motifs, and new tourist items.

In conclusion, the teaching of weaving is turning out to be remarkably responsive to societal changes, notably the movement from agricultural subsistence to an entrepreneurial cash economy. As predicted, we are finding a definite movement from highly scaffolded relatively errorless learning, involving a great deal of observation of models (1970), toward a much more independent sort of trial-and-error learning(1991), as illustrated in the video clips that I showed.

At the same time, and also as predicted, the stock of four rather carefully defined striped and basketweave patterns has grown to an infinite number of complex figurative and geometric patterns, with motifs that are constantly changing and being recombined in new ways. Independent trial-and-error learning was, indeed, associated with pattern innovation, as the theoretical model predicted.

Our example of weaving instruction indicates that the process of socialization prepares the next generation to participate in society, even under conditions of societal change. Even in Zinacantan, a society that, in 1970, was based on respect for tradition, we see that changing socialization patterns are indeed a very real component of the psychological adaptation to social change. For the first time, we have direct longitudinal empirical historical evidence on this issue in the psychology of teaching and learning. We have found that parents do not merely recreate the socializing process that they underwent as children. There is a tremendous capacity to develop new methods of cultural apprenticeship as societal conditions, in this case, economic conditions, change. These new methods entail changes in human relations, as well as changes in cultural artifacts. They also entail new cognitive consequences that are revealed in culturally central activities, as weaving is for Zinacanteco girls and women. More broadly, our study of three generations of Zinacanteco weavers - grandmothers, mothers, and daughters - exemplifies learning and teaching as key components of the human capacity to adapt to a changing environment.

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